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AMENDED DIRECT AND REBUTTAL TESTIMONY

OF

DR. WILLIAM E. TAYLOR

BEFORE THE

NORTH CAROLINA UTILITIES COMMISSION

ON BEHALF OF

CAROLINA TELEPHONE AND TELEGRAPH COMPANY

AND

CENTRAL TELEPHONE COMPANY

DOCKET NO. P-7, SUB 825; P-10, SUB 479

FEBRUARY 9, 1996

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Q. DR. TAYLOR, WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. Carolina Telephone and Telegraph Company and Central Telephone Company ("the Companies") have asked me to evaluate, from an economist's perspective, the stipulated price regulation plan ("the Stipulated Plan" or "the Plan") which they negotiated with the Public Staff on January 31, 1996. This plan supersedes and differs from the original proposal which the Companies filed with the Commission. Dr. Francis J. Cronin submitted direct prefiled testimony for these dockets and reviewed the Companies' original proposal. Given the short timeframe for filing rebuttal testimony, Dr. Cronin did not have time to adequately review the Stipulated Plan. Given NERA's familiarity with the structure of the Stipulated Plan and its similarity to that of BellSouth, I was asked to review the Plan and express an independent opinion. My evaluation includes an assessment of whether the Stipulated Plan offers benefits to North Carolina consumers, is consistent with sound economic principles, and satisfies the criteria of the legislation.

In addition, I respond to other witnesses' criticisms of the Companies' original proposal, some of which they might argue would also apply to the Stipulated Plan. Specifically, I respond to comments filed by David L. Kaserman, G. Wayne Ellison, and John R. Norsworthy on behalf of AT&T and to Don J. Wood on behalf of MCI.

Q. WHAT IS THE RELATIONSHIP BETWEEN YOUR TESTIMONY AND THAT OF DR. LEWIS J. PERL OF NERA ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS?

A. Dr. Perl and I have jointly sponsored testimony or have collaborated on numerous studies in the past dealing with issues of price regulation and competition in telecommunications markets. Because of the similarities between the Stipulated Plan for the Companies and that for BellSouth, we collaborated here. For use in the current dockets, I have adapted relevant parts of Dr. Perl's direct and rebuttal testimonies in this Commission's Docket No. P-55, Sub 1013.

Q. HOW DOES YOUR TESTIMONY RELATE TO DR. CRONIN'S DIRECT TESTIMONY ON BEHALF OF THE COMPANIES?

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, CURRENT POSITION, AND BUSINESS ADDRESS.

A. My name is William E. Taylor. I am Senior Vice President of National Economic Research Associates, Inc. (NERA), head of its Communications Practice, and head of its Cambridge office, located at One Main Street, Cambridge, Massachusetts 02142.

Q. PLEASE OUTLINE YOUR EDUCATIONAL AND PROFESSIONAL QUALIFICATIONS.

A. I have been an economist for over twenty years. I received a B.A. degree in economics (Magna Cum Laude) from Harvard College in 1968, a master's degree in statistics from the University of California at Berkeley in 1970, and a Ph.D. in Economics from Berkeley in 1974, specializing in industrial organization and econometrics. I have taught and published research in the areas of microeconomics, theoretical and applied econometrics, and telecommunications policy at academic institutions (including the economics departments of Cornell University, the Catholic University of Louvain in Belgium, and the Massachusetts Institute of Technology) and at research organizations in the telecommunications industry (including Bell Laboratories and Bell Communications Research, Inc.). I have participated in telecommunications regulatory proceedings before state public service commissions and the Federal Communications Commission concerning incentive regulation, price cap regulation, productivity, access charges, and pricing for economic efficiency. A copy of my vita listing publications and testimonies is attached as Exhibit A.

A. I have read Dr. Cronin's testimony and concur with the portion of it (pages 4-16) that explains the principles and advantages of price regulation and describes the competitive environment in local telecommunications markets in North Carolina.

Q. PLEASE BRIEFLY SUMMARIZE YOUR CONCLUSIONS REGARDING THE STIPULATED PLAN.

A. The North Carolina legislature set out four criteria for the North Carolina Utilities Commission (the "Commission") to follow in reviewing and approving a price regulation plan. The proposed price regulation plan must:

- protect the affordability of basic local exchange service,
- reasonably assure the continuation of basic local exchange service that meets reasonable service standards that the Commission may adopt,
- not unreasonably prejudice any class of telephone customers, including telecommunications companies, and
- otherwise be consistent with the public interest.

In my view, the Stipulated Plan meets all of those criteria. It assures affordable service meeting reasonable quality standards which the Commission has adopted, and it will not unreasonably prejudice any class of customers. But, beyond meeting those explicit goals, the principal advantages of the Stipulated Plan lie in promoting the interests of North Carolina customers in ways which are not explicitly spelled out in the legislation but rather are covered broadly by the fourth criterion.

In particular, I believe that the Stipulated Plan promotes the public interest in four specific ways.

First, it enhances the flexibility with which the Companies can respond efficiently to the competitive challenges which exist in some telephone markets today and which will expand to others in the future. Such flexibility is precluded by rate of return regulation. Without this flexibility, competition may well lead to uneconomic and inefficient outcomes. The Stipulated Plan provides the Companies substantial flexibility to provide a wide range of discretionary services while still providing consumers with protection in markets for basic telecommunications services.

Second, the Companies' participation will avoid the Balkanization of telephone markets in North Carolina and permit the benefits of competition to be distributed as equitably as possible to all market segments rather than being limited to those areas, services, or customers which are most easily subject to competition. The Stipulated Plan provides a framework for promoting free and fair competition among all potential players.

Third, the Stipulated Plan gives the Companies strong incentives to improve efficiency and introduce new services, while shifting the risks of such efforts from consumers to shareholders. I believe that traditional rate of return regulation does not provide regulated companies with the full range of economic incentives to minimize costs or actively to pursue innovation. Price regulation of the form proposed here will increase efficiency because it permits the Companies to increase earnings if they can reduce costs, develop new products which attract a market following, or expand the market for existing products through improved product quality. Price regulation also increases performance incentives by making investors responsible for cost increases or for investments which prove unsuccessful.

Fourth, the Stipulated Plan also deals more effectively with the multiplicity of services that is characteristic of modern local exchange carriers like the Companies than does traditional rate of return regulation. Over the past decade, telecommunications markets have been subject to a number of innovations which have dramatically increased the number and range of products which can and should be supplied over traditional telecommunications networks. Many of these products are sold in markets which are or can be highly competitive and hence do not need rate constraints. Other services, whether sold in competitive markets or not, are clearly sufficiently discretionary that rate of return regulation is unnecessary and unproductive.

Q. PLEASE ALSO SUMMARIZE YOUR RESPONSES TO COMMENTS BY OTHER WITNESSES.

A. The principal criticisms articulated by various commentators do not provide a valid basis for reviewing the Stipulated Plan. These criticisms can be divided into three broad categories. First, some critics argue that the Commission should conduct a full review before implementation to assure that initial rates of return are in line with the Companies' cost of capital and that individual service prices are in line with cost. For reasons spelled out more fully below, I believe that such revisions are unnecessary and in some cases counterproductive.

Second, some critics argue that the productivity adjustments built into the regulation price index are too low. My review, however, indicates that these critics demonstrably exaggerate historical trends in productivity, extrapolate short term declines in relative input prices which are unlikely to continue, and misapprehend the productivity trends which are now reflected in the Stipulated Plan.

Third, others argue that the plan needs substantially greater safeguards to assure the competitiveness of telecommunications markets. These include higher floors under rates, substantial rebalancing to align rates and costs, and stronger prohibitions against cross-subsidies between competitive and noncompetitive markets. In my view, none of the proposed changes are necessary to assure competitiveness, and some will actually make the Plan less competitive. Moreover, issues about the steps needed to assure market competitiveness are more appropriately resolved in separate hearings.

II. SUMMARY OF THE STIPULATED PRICE REGULATION PLAN

Q. PLEASE SUMMARIZE YOUR UNDERSTANDING OF THE STIPULATED PRICE REGULATION PLAN.

A. The North Carolina legislature has permitted local exchange carriers in the state to elect a price regulation plan to replace traditional rate of return regulation. The Companies and the Public Staff have agreed to a Stipulated Plan that is consistent with the philosophy of the legislation. My understanding of the Stipulated Plan's key features are the following:

Basic Services:

- For the first three years, residence basic local exchange service rates will not increase. The affected rates are for Residence Individual Line Service, Residence Touch-Tone Service, Residence Service Order, and Residence Central Office Work.
- For the first three years, aggregate rates for the other services in the Basic Services category will rise annually at a rate no greater than inflation minus two percent.

These other Basic services include extended and expanded area services, business local exchange service, local directory assistance, public telephone service and switched access services.

- After the first three years, aggregate rates for all services in the Basic Services category—residence rates and all others combined—will rise no faster than the rate of inflation minus two percent per year.

- Rates in the aggregate for Toll Switched Access Services may not rise above their initial level.

Interconnection Services: aggregate rates may rise no faster than the rate of inflation minus two percent per year. This category includes interconnection service for mobile service carriers, access line service for customer-owned coin operated telephones, special access service, and sharing and resale tariffs.

Non-Basic 1 Services: aggregate rates may rise no faster than the rate of inflation minus two percent per year. This category includes directory listing services, foreign exchange service, PBX trunks, custom calling services, ExpressTouch® Service, intraLATA toll service, WATS, and private line services.

Non-Basic 2 Services: the Stipulated Plan does not limit changes in aggregate rates for this category, which primarily contains Digital Centrex (Advanced Business Connection®), billing, and collection services.

The Stipulated Plan limits the change in rates in the aggregate for the services in each category, while it permits the Companies to raise or lower rates for individual services. In addition, it constrains annual rate increases for individual rate elements. In the Basic Services category (except for capped residence rates during the first three years and toll switched access rates), the annual increase in the rate for any one rate element may not exceed 3 percentage points more than the inflation rate. In the Interconnection Services and Non-Basic 1 Services categories, the annual increase in the rate for any one rate element may not exceed 7 and 15 percentage points, respectively, more than the inflation rate. The Plan has no limits on changes in individual rate elements in the Non-Basic 2 Services category.

The Stipulated Plan provides for Commission review of the operation of the Plan after five years. The Plan's measure of inflation is the change in the Gross Domestic Product Price Index (GDP-PI), published by the U.S. Department of Commerce. The Plan permits the financial

[redacted]

impacts of governmental actions to be passed through in rate changes. It also has other provisions, including some about tariff change notice requirements and new services.

III. THE ECONOMIC BENEFITS OF THE STIPULATED PLAN

Q. WHAT ARE THE OBJECTIVES OF A PRICE REGULATION PLAN?

A. For an economist, regulation should imitate the process of competition in those markets where competition is not present. In competitive markets, this process leads to a number of good economic outcomes, including just and reasonable prices, suitable levels of service quality, an efficient use of scarce resources, the proper rate of technical progress, support for efficient competition, and an adequate incentive to implement and market new products and services. Price regulation plans try to achieve these goals by establishing incentives for the regulated firm so that it will be led—following its own self-interest—to behave in the same manner as a firm in unregulated markets.

Q. HOW DO THE INCENTIVES UNDER THE STIPULATED PLAN DIFFER FROM THOSE THAT THE COMPANIES WOULD FACE UNDER TRADITIONAL RATE OF RETURN (ROR) REGULATION?

A. Price regulation attempts to rectify some of the incentive problems of traditional rate of return (RoR) regulation. First, price regulation directly addresses the primary reason why the firm is regulated: the efficiency loss from the reduction in output due to the high monopoly price. Price regulation replaces the competitive process, in that it prevents the firm from inefficiently increasing its aggregate price. Like the competitive process—but unlike RoR regulation—price regulation puts no direct control on the rate of return that a firm can earn. Second, by eliminating the cost-plus feature of RoR regulation, price regulation rewards firm efficiency gains (beyond a fixed standard) with higher profits. Third, separating the link between investment in the rate base and automatic recovery of that investment through prices forces the firm to justify investment according to the profits it can earn on that investment. This effect, in turn, eliminates the theoretical Averch-Johnson bias in factor proportions and removes the Averch-Johnson incentive to expand inefficiently into additional markets.[1] Price regulation also frees the regulated firm to undertake whatever ventures it chooses, receiving whatever rewards the market will allow, without exposing captive ratepayers to the risk of underwriting unsuccessful ventures. Fourth, since prices are easier to measure and track than profits, price regulation greatly reduces the administrative costs of regulation.

A. The Stipulated Plan promotes efficient competition

Q. WHY IS PRICE REGULATION NECESSARY TO AVOID UNECONOMIC OR INEFFICIENT COMPETITION?

A. Under traditional rate of return regulation, the incumbent carrier may be driven out of markets even when it is the lowest-cost supplier of the relevant service. The result is uneconomic or inefficient competition, where high-cost suppliers displace the lower-cost incumbent at the expense of consumers. This outcome occurs because rate of return regulation affords the regulated carrier little flexibility to vary rates promptly to respond to competitive pressures, and historically rates in many potentially competitive markets have been set well above incremental cost. Competitors will be attracted to such markets and may profitably enter and gain market share before the regulated firm can lower its rates sufficiently to respond to the competition. This can occur even though the incumbent firm has supply costs which are well below those of the competitive entrant. Although the entry lowers rates in the competitive market, it raises the overall cost of phone service by substituting a higher-cost for a lower-cost supplier. Ultimately consumers will have to bear the burden of such cost increases.

In addition, rate of return regulation may result in uneconomic competition because it deprives the incumbent of adequate incentives to invest in marketing programs, new services, and infrastructure which are necessary to respond to competitive pressures. The problem occurs because investments in competitive marketing efforts are inherently risky. When successful, these investments may allow the incumbent firm to retain or expand its market share. However, even sensible investments may not prove to be successful, and market share may nevertheless be

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[1] See H. Averch and L.L. Johnson, "Behavior of the Firm Under Regulatory Constraint," *American Economic Review*, Vol. 52 (1962), pp. 1053-1069. When the allowed rate of return is higher than the cost of capital, the Averch-Johnson incentive means that the firm will employ too much capital; *e.g.*, in certain circumstances it will expand into otherwise unprofitable markets.

lost. In such cases the investments may lead to substantial cost increases. Given the extent of these risks, traditional rate of return regulation may not offer sufficient incentives to justify the investments. The regulated firm may feel that, if the investments are successful, it will simply recover them and earn its regulated cost of capital. However, where the investments are not successful, they may be partially or fully disallowed as imprudent or unnecessary. On average, then, the regulated firm will be unable to recover its investments and thus have insufficient incentives to make them. The upshot is that the incumbent regulated firm may fail to make investments needed to succeed, and hence it will lose market share even when it is potentially the lowest-cost supplier. Once again, these perverse incentives can result in uneconomic competition, the cost of which is ultimately borne by consumers.

By increasing rate flexibility and improving incentives, price regulation reduces the likelihood of such uneconomic outcomes. Because the incumbent has increased rate flexibility, it can respond to competitors and retain market share wherever its costs are lower than the competitors' costs. In these cases competition is more likely to favor the lowest-cost competitor, and hence competitors will succeed only where they reduce overall telecommunications costs. In addition, because the incumbent can capture the full returns on investments in new products when those investments are successful, it will have appropriate incentives to make those investments and therefore to retain market share where it has a genuine cost advantage. As with increased rate flexibility, the net effect is to increase the likelihood that competitors will succeed only where they have a real cost advantage and hence lower the overall cost of phone service.

Q. WHY IS PRICE CAP REGULATION NECESSARY TO ASSURE A MORE EQUITABLE DISTRIBUTION OF THE BENEFITS FROM COMPETITION?

A. Competition in at least some telecommunications markets seems almost inevitable given both market and technology developments of the past decade. But such competition is unlikely to proceed evenly. It is likely to occur first for high-volume customers in relatively urbanized areas where potential profits are high. Competition for lower-volume customers—particularly residential customers in rural areas—could take longer.

Faced with competition but with little ability to respond to that competition flexibly, the incumbent carrier will lose substantial market share in the potentially competitive markets and be left disproportionately serving the less competitive markets—particularly rural customers with low volumes. However, without retaining a share of the competitive markets, the incumbent must recover the bulk of its costs from relatively low-volume customers in relatively rural areas. These areas will inevitably face higher rates when they receive smaller subsidies from the areas subject to competition. Further, the incumbent carrier's remaining customers may also have to bear some of the costs of the investment that becomes underutilized as a result of competition. The effect is to produce a society of telecommunications "haves" and "have nots." Urbanized areas and high-volume customers will receive most of the potential benefits of competition in their markets, with low rates and a diverse range of services. They only miss out on the additional benefits they could have received had the incumbent been free to meet or beat the competitors' offerings. Consumers in rural areas, however—deprived of the subsidies they had been receiving from urbanized and high-volume customers and bearing some of the costs of underutilized investments—will have to get by with higher rates and a less diverse mix of services.

Contrast that outcome with what will occur with a price regulation plan. Because the incumbent carrier can respond more flexibly to competitive threats, it is less likely to lose market share in potentially competitive markets. Although it might still need to lower rates in these markets, it is likely to retain some contribution from these markets, allowing it to continue, within limits, to subsidize service for lower-volume customers in more rural areas. Although competition might force reductions in the extent of such historical cross-subsidies, the extent of the remaining subsidies are likely to be larger when incumbents are given rate flexibility and allowed to compete in the urban markets than when they are not. Consequently, with the rate flexibility afforded by price regulation, the benefits afforded by competition will not only be larger but more evenly distributed than if the incumbent were to continue to operate under rate of return regulation.

Q. IF COMPETITION HAS ARRIVED OR WILL ARRIVE IN TELECOMMUNICATIONS, WHY NOT SIMPLY DEREGULATE? WHY IS ANY FORM OF REGULATION STILL REQUIRED?

A. If competition were a *fait accompli* in all telecommunications markets, deregulation would be the right solution. The only reason to retain regulation is that some telephone services are offered by a single supplier.

The problem is that while some telecommunications markets are competitive today, and all telecommunications markets seem at least potentially competitive, the pace of competition varies from market to market and is inherently uncertain. There is already competition in the intraLATA toll market. Local telephone service, long thought to be the heart of a local exchange carrier's natural monopoly, is also becoming increasingly competitive. The extent and pace of competition varies not only by product but also by customer type. Thus, competition in local markets may come somewhat faster for business customers in urban areas than for residential customers in rural areas. What is needed is not deregulation of telecommunications services (although that ultimately may come to pass), but rather a new regulatory compact which:

- provides some continued price protection in markets which are essential and possibly dominated by a single supplier;
- provides incentives to telephone suppliers to invest wisely in new and existing markets;
- relieves consumers of the risk of supporting new investment; and
- assures that competition which does take place occurs on an efficient basis.

Q. PLEASE EXPLAIN HOW THE STIPULATED PLAN ACCOMPLISHES THOSE OBJECTIVES.

A. First, and foremost, the proposal represents a shift from rate of return to price regulation. Instead of setting all rates to assure a fair return on historical investment, the Stipulated Plan establishes pricing rules for all tariffed services. Because these rules are set without regard to the return earned on either historical or prospective investments, they place investment risks on investors.

Second, by increasing pricing flexibility for services which either are workably competitive or are discretionary services, the proposal provides the Companies greater flexibility to compete effectively in those markets where they are the low-cost provider or are cost-competitive. At the same time, by freeing the Companies from earnings constraints, it allows them to benefit from innovations which reduce costs or expand markets and hence increases their incentive to make such investments without risk to consumers.

Third, by capping rates for residential basic exchange services at their current levels for three years, and by subsequently limiting the growth in basic exchange rates to inflation minus two percent, the proposal protects consumers from the exercise of monopoly power.

Fourth, because these pricing rules will constrain the aggregate increase in rates well below the rate of inflation and will constrain rate increases for most individual rate elements to three percent above the rate of inflation, they permit consumers of telephone service to share in the anticipated productivity improvements which result from innovation, technological change, and investments in new markets.

B. The Stipulated Plan improves incentives

Q. PLEASE EXPLAIN WHY TRADITIONAL RATE OF RETURN REGULATION DOES NOT PROVIDE APPROPRIATE INCENTIVES IN CURRENT TELECOMMUNICATIONS MARKETS.

A. The guiding principle underlying rate of return regulation is that prices are set to afford investors a reasonable opportunity to recover any prudently incurred costs of supplying services. These include reasonable operating costs, capital investments, interest on debt and a fair return on equity. Such pricing rules provide both a ceiling and a floor on profitability. Investors are assured recovery of investment costs even when, after the fact, such costs prove unneeded or represent something other than the least cost way of supplying a service. On the other hand, when investments prove unusually prescient and would, in unregulated markets, offer opportunities for extraordinary returns, rate of return regulation would constrain investors to earning the prescribed return on those investments.

Where producers offer a relatively narrowly defined and essential service over which they hold an effective monopoly, such an approach may work reasonably well to protect consumers from potential abuse of monopoly power and to assure that product demands are met in a reasonably cost-effective fashion. History would suggest that companies operating under rate of return regulation endeavor to produce (and typically succeed in producing) a reliable product at low cost. Certainly the experience with United States telecommunications service has historically been viewed as evidence that cost of service regulation can result in low cost, reliable, high quality service.

Although this outcome is often taken for granted, it is actually fairly surprising. Because firms with rate of return regulation do not necessarily earn any higher returns whether they are cost-effective service providers or not, we ought to be surprised that the historical experience with rate of return regulation has been as good as it has.

Undoubtedly, the good outcomes reflect the operation of an implicit regulatory bargain which implies that good service will be rewarded with reasonable returns and poor service with lower returns. It is also argued that regulated local exchange carriers perform well because they fear loss of their franchise. And, it has been argued that the political difficulties of achieving rate increases and the existence of substantial regulatory lags, which permit providers to benefit from cost reductions between rate cases, provide substantial incentives, even in a rate of return environment, to reduce costs. Finally, the good outcomes may occur because the managers and employees of any institution achieve personal satisfaction from producing a low price, high quality service even when their earnings do not depend on this outcome.

Even when all these conditions are met, however, economists and other analysts have long voiced concerns that rate of return regulation does not provide enough incentive to control cost or to innovate and may, in fact, encourage excessive investment. This is because the regulated firm stands to earn a return on all investments deemed prudent (even if they are not necessarily cost minimizing or necessary to meet demand) and because all or most of the benefits of improved efficiency are passed on to consumers, thereby reducing the incentives of management to invest time, energy and money to control costs.

C. The Stipulated Plan benefits customers

Q. DOES THE STIPULATED PLAN GIVE CUSTOMERS A REASONABLE PROSPECT OF RECEIVING THE ANTICIPATED BENEFITS OF PRODUCTIVITY IMPROVEMENTS?

A. Yes. I have calculated that, over the next five years, the Stipulated Plan will deliver to the Companies' customers real cumulative rate decreases of at least 16.1 percent in the state jurisdiction relative to todav's rate levels. In combination with interstate access rate decreases to which the Companies are already committed, the Companies' total reduction will be at least 17.8 percent. The latter decrease is much greater than the 9.8 percent cumulative reductions that customers would receive by the fifth year if the Companies were to pass through productivity gains that average local exchange carriers have historically achieved. The implication is that consumers can expect greater rate reductions under the Stipulated Plan than they would get without the Plan.

This table summarizes my calculations. The table's first column lists the service categories. The second column shows each service category's revenues as a percentage of total revenues for Carolina Telephone.[2] The third and fourth columns show the minimum cumulative and average compounded annual rate declines in real terms that customers would see under the Stipulated Plan during the five years before Commission review.[3] The actual rate reductions may even be greater than these rates that the Plan specifies as minimums because competition may very well force the Companies' rates below the price regulation index.

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[2] Comparable data by service category were not available for Centel, so I use data for Carolina Telephone as a proxy for the two companies together. This approximation should be reasonably accurate, since Carolina Telephone has 81 percent of the lines of the two companies.

[3] I use the GDP-PI forecast from the U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (September, 1995).

The Stipulated Plan's Minimum Five-Year Real Rate Reductions

Service Category	Percentage of YTD 6/95 Revenues[4]	The Plan's Minimum Five-Year Real Rate Reductions: Cumulative	Annual
State Jurisdiction			
Basic Services	52.8%	-17.1%	-3.7%
Interconnection Services	0.8%	-9.3%	-1.9%
Non-Basic 1 Services	19.7%	-16.2%	-3.5%
Non-Basic 2 Services[5]	2.4%	0.0%	0.0%
State Total	75.7%	-16.1%	-3.4%
Interstate Jurisdiction			
Access Services	24.3%	-23.1%	-5.1%
Total, or Weighted Average	100.0%	-17.8%	-3.8%

Rigorous productivity improvement studies are available only for the combined state and interstate operations of the telephone companies; after all, their plant jointly provides both services. That is why I include interstate data in the table.

According to a definitive recent study, local exchange carriers have achieved an annual productivity growth that is 2.1 percentage points greater than the economy as a whole over the long term.[6] (I use the phrase "productivity differential" to refer to the difference in productivity growth between local exchange carriers and the economy as a whole.) If the Companies were to pass through to their customers this historical 2.1 percent per year productivity differential for the next five years, then the cumulative real rate reduction would equal only 9.8 percent. As one can see, the minimum real rate reduction that customers should expect to receive from the Stipulated Plan and the Companies' interstate commitments is 17.8 percent, or 3.8 percent per year,

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4 I exclude the Company's non-tariffed services from the calculations. I calculate revenue shares based on data for year-to-date booked revenue through June, 1995.

5 I assume that competition will limit price changes to no more than the rate of inflation; *i.e.*, real prices in this service category will not rise.

6 L. R. Christensen, P. E. Schoech, and M. E. Meitzen, "Productivity of the Local Operating Telephone Companies Subject to Price Cap Regulation" (January 16, 1995). Also, see Exhibit B, summarizing other productivity studies with similar results.

substantially more than customers would expect to receive based on historical standards. Because of competitive pressures, the actual reductions may be greater than 17.8 percent.

The Federal Communications Commission (FCC) recently held a review of its price cap policies and proposed to give local exchange carriers a choice of price cap adjustment rates, each with different sharing arrangements.[7] Many carriers, including the Companies, have opted for the 5.3 percent commitment—i.e., that they will change interstate access rates by 5.3 percent less than the change in the GDP-PI.[8] It is the option where a carrier commits to a high rate of price reductions but is not under an earnings sharing component. This figure of 5.3 percent per year is the one I use in the above table for the interstate calculation.

Opportunities to increase productivity growth in the interstate jurisdiction must be greater than in the state jurisdictions. Switching and interoffice transmission equipment heavily influence productivity growth in the interstate jurisdiction. Prices of such equipment have fallen rapidly, and its capabilities have increased rapidly. In the state jurisdiction, however, loop costs dominate. I understand that loop cable prices and their installation costs have been increasing modestly rather than decreasing. Thus, although historical differential productivity gains for local exchange carriers have averaged 2.1 percent per year for their operations as a whole—state plus interstate—the differential productivity gains in the state jurisdiction alone must be significantly less than 2.1 percent per year.

Q. ARE THERE REASONS WHY UNUSUAL GAINS IN EFFICIENCY MAY BE NECESSARY MERELY TO ACHIEVE THE HISTORICAL RATE OF PRODUCTIVITY GROWTH?

A. Yes. Some of the historical rate of productivity growth as measured by Christensen and others is attributable to the growth of services whose rates have been well above their incremental costs. Examples of such services are intraLATA toll and switched access. Since their rates exceed their

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[7] Federal Communications Commission, CC Docket No. 94-1, *Fourth Further Notice of Proposed Rulemaking* (September 27, 1995).

[8] *Ibid.*, p. 6, fn. 17. This 5.3 percent commitment should not be interpreted as an estimate of the productivity growth differential that the local exchange carriers have historically achieved in the interstate jurisdiction. It simply represents a strategic choice among available alternatives.

incremental costs, when demand for them grows, the growth causes customers to receive more additional value than it causes more needed inputs.

Intensified competition will force down rates for toll service and for toll switched access services and will thereby reduce the measured productivity growth attributable to growth in these services. Thus, the Companies cannot expect this contribution to their measured productivity growth to continue at historical levels.

IV. THE STIPULATED PLAN PROTECTS BASIC LOCAL EXCHANGE SERVICE CUSTOMERS

A. Affordability

Q. IS THE COMPANIES' BASIC LOCAL EXCHANGE SERVICE CURRENTLY AFFORDABLE IN NORTH CAROLINA?

A. Yes. There are several important pieces of evidence that it is affordable.

First, from 1985 to 1993 (the most recent year for which I have data), real per capita personal income rose 15.1 percent in North Carolina, which is an average compounded growth rate of 1.8 percent per year. Further, over the last decade, Carolina Telephone's real rates for a residence Touch-Tone line in its largest cities—even including the subscriber line charge that the Federal Communications Commission imposed—have fallen by about 15 percent. Stimulated by the income growth and lower rates, 92.6 percent of the households in North Carolina had telephone service in 1994.[9] This penetration is close to the national average of 93.8 percent. Few goods or services are as widely purchased by households as telephone service, which clearly shows that the service is affordable in North Carolina.

Second, the Companies' rates for residential basic local exchange service in North Carolina are lower than they are in most other comparable areas. Carolina Telephone's and Centel's rates for R1 service in the largest cities they serve in North Carolina are $13.10 and $12.02, respectively. In 1994, Carolina Telephone's rate was lower than BellSouth's large-city rate in six

[9] This figure is for North Carolina as a whole. Data on the residence telephone penetration rate are unavailable for the Companies separately.

out of the nine states BellSouth serves; Centel's rate was lower than BellSouth's rate in all but one of BellSouth's states. The minimum rate in the BellSouth states was $10.65, and the highest was $20.10. If one compares the Companies' rates in North Carolina with the rates for the former Bell Operating Companies throughout the nation, one finds that 61 percent of the jurisdictions have higher R1 rates than Carolina Telephone does, and 78 percent have higher rates than Centel.

The Companies also have low business rates. Both Carolina Telephone's and Centel's rates for B1 lines is lower than all but one of BellSouth's rates in its states. Further, in the nation as a whole, 64 percent of the states with flat-rate business service have a higher Bell rate than Carolina Telephone does, and 76 percent have a higher rate than Centel does.

Third, the Companies have the Link-up and LifeLine programs to assist low-income households to afford telephone service. Almost all households with moderate to high incomes have telephone service, and the demand for telephone service by these households is highly insensitive to changes in telephone rates. Thus, only for low-income households is affordability of telephone service an issue. The overall consumer response to changes in local exchange service rates is very small, and that small reaction is mostly attributable to low-income households. By providing the Link-up and LifeLine programs for low-income households, the Companies assure that service is affordable for virtually all consumers in their franchised areas.

Fourth, compared with other goods and services one could buy, telephone service has an extremely modest price. In their largest cities, the Carolina Telephone's R1 rate is $13.10, and Centel's rate is $12.02. In addition, for non-LifeLine lines the FCC's subscriber line charge is $3.50, and the Touch-Tone charge is $1.22. Those three charges sum to only $17.82 for Carolina Telephone and $16.74 for Centel. (Households that choose to economize can use a dial telephone and save an additional $1.22 per month.) Compare that rate with the following examples of prices for other goods and services in Raleigh, where the Commission is located:

- A large supreme pizza and four cans of Pepsi from Pizza Hut: $20.25
- Movie tickets for two adults and two children: $20.00 (excluding popcorn)
- Cable television service per month: $23.00 for 25 channels
- 15 gallons of 93-octane gasoline from a BP station: $18.88

- 4.5 video rentals per month (about one per week): $16.65.

Q. HOW WILL THE STIPULATED PLAN CAUSE RATES TO CONTINUE TO BE AFFORDABLE?

A. The Stipulated Plan will not only ensure that rates will continue to be affordable; it will make basic telephone service even *more* affordable than it is today. The primary issue here is to ensure affordable rates for *residence* basic exchange service. After all, I assume that virtually every business in the state chooses to subscribe to telephone service. There are several reasons why residential basic exchange service will remain or become more affordable under the Stipulated Plan.

First, the Stipulated Plan precludes increasing residential basic exchange service rates for the first three years. For my calculations, I assume that the Stipulated Plan is implemented in 1996. Based on the U.S. Department of Commerce GDP-PI inflation forecast, residential basic rates will fall in real terms by over nine percent by 1998. This decrease, plus the additional 2.5 percent decrease in real rates from 1994 to 1995, will increase North Carolina's telephone penetration by about 0.7 percentage point, to 93.3 percent, even without the other effects I will discuss shortly.[10]

Second, after the first three years, the Stipulated Plan limits the annual rate changes of the Basic Services category as a whole to be no more than inflation minus two percent. Necessarily, therefore, average rates for services in the category as a whole will continue to decrease in real terms.

Third, as telephone penetration has risen, households are responding less to price changes. For instance, in 1984, in response to a $1 increase in the rate for basic exchange service, the penetration rate would have fallen by about 0.6 percentage points, other things equal. Yet at today's higher penetration rate, such a $1 rate increase would only reduce penetration by about 0.4 percentage points, other things equal. Therefore, even if real residential rates were to increase

[10] Calculations of price effects, as well as those for income growth discussed below, are based on the demand model reported in L. J. Perl, "Residential Demand for Telephone Service 1983," prepared for the Central Services Organization of the Bell Operating Companies, Inc. (December, 1983), and L. J. Perl, "Revisions to NERA's Residential Demand for Telephone Service 1983," prepared for the Central Services Organization of the Bell Operating Companies, Inc. (April 24, 1984).

slightly, the effect on penetration—the primary index of affordability—would be trivial and dominated by the further effects I discuss next.

Fourth, I expect per capita income to continue to rise in North Carolina. In two senses, this income growth causes telephone service to become more affordable. One sense is that basic exchange service will consume a smaller fraction of the average household's income. The other sense is that studies have found that telephone penetration increases as the average income rises. If real per capita personal income were to continue to rise by 1.8 percent per year in North Carolina for the next six years, I calculate that penetration will increase by a further 1.5 percentage points over the level in 1994, other things equal. Thus, income changes alone will raise the penetration rate from 92.6 percent to about 94.1 percent. When I calculate the combined effects of the real rate decrease through 1998 and of the income growth, I find that penetration in 2001 would be 94.7 percent if real rates were not to change further between 1998 and 2001. To eliminate this progress from 1994's 92.6 percent penetration, the rate for a Touch-Tone line in 2001 would have to rise by 54 percent in terms of current year dollars from the level in 1998. Such a large increase would exceed the Stipulated Plan's restriction that the rate for a rate element in the Basic Service category may not rise each year by more than three percent plus inflation. Since penetration must be higher six years from now than it was in 1994, the Stipulated Plan indeed assures greater affordability of telephone service.

Fifth, even after controlling for changes in exchange rates and incomes, there is evidence that the penetration rate has historically tended to increase over time by about 0.3 percentage points per year.[11] From the time trend alone, I would expect the penetration rate in North Carolina to increase at least an additional one percent over the next six years.

Sixth, economists have found that decreases in other telephone rates increase telephone penetration.[12] The demand for a telephone line is, in large part, a derived demand. In other words, a consumer decides whether to get a telephone line based on the benefits that the consumer derives from using the telephone. As competition will drive down intraLATA toll rates, for example, the net benefit of using the telephone increases, and the demand for telephone

[11] L. J. Perl and W. E. Taylor, "Telephone Penetration," a chapter in B. Cole, ed., *After the Break-Up: Assessing the New Post-AT&T Divestiture Era* (New York: Columbia University Press, 1991), pp. 357-370.

[12] See J. Hausman, T. Tardiff, and A. Belinfante, "The Effects of the Breakup of AT&T on Telephone Penetration in the United States," *American Economic Review* (May 1993), pp. 178-184.

lines will increase. This change will increase telephone penetration. The same point applies to other services that are complementary to telephone lines and will be subject to competition.

Finally, changes in the rate for basic exchange service is not even an issue for many households that do not subscribe. A survey found that 56 percent of respondents said that they do not have telephone service because of the cost; the implication is that 44 percent do not have service for reasons *other than* the cost.[13] The reasons vary widely. Some consumers want to avoid bothersome incoming calls; some feel no need to call anyone; some prefer to live in a remote mountain cabin; and so forth. Further, of those for whom affordability is an issue, the most frequently stated deterrents to subscribing were not the monthly rate for the line but the "cost of calls outside the U.S." (49 percent) and the "cost of calls within the U.S." (40 percent). (Multiple responses were possible.) The basic monthly cost ranks near the bottom of the chart as a reason why telephone service is hard to afford (23% of respondents). Thus, only for a small subset of the households that do not subscribe would any changes in residential basic exchange rates potentially affect the affordability of telephone service.

Q. DO WE HAVE TO BELIEVE THAT LOCAL EXCHANGE COMPETITION IS HERE OR IMPENDING IN ORDER TO IMPLEMENT THESE PROPOSALS?

A. No. Even if competition does not emerge, the proposal continues to protect consumers of basic service through rate caps and other pricing rules. For the first three Plan years, residence basic local exchange service charges are capped at their current levels. Thus, even if none of the charges for those services are reduced, the real cost of residence basic service will decline by the rate of inflation over the next few years. According to U.S. Commerce Department forecasts, inflation will average over three percent per year during the 1996 to 1998 period. Thus, if I calculate Plan effects as if the Plan were to begin at the beginning of this year, then residence customers are assured a cumulative 9.3 percent decline in the real price of telephone service over that three-year period.

Although the Stipulated Plan gives the Companies greater pricing flexibility after the first three Plan years, customers of Basic Services as a whole are still assured that, after the first three

[13] Field Research Corporation, "Affordability of Telephone Service: A Survey of Customers and Non-Customers," conducted for Pacific Bell and GTE in California using 1993 data.

years, the aggregate cost of Basic Services may not rise faster than the rate of inflation minus two percent per year; in other words, aggregate real Basic Services rates must decline by at least two percent per year. Moreover, since prices cannot rise at all for the first three Plan years, assuming any inflation, the real price of phone service will decline over that period. Finally, the Stipulated Plan specifies additional rate reductions of $30 million over three years, which is about six percent of the Companies' current annual intrastate revenues. A significant portion of this reduction is targeted to services in the Basic Services category. Consequently, the proposal assures that the real price of basic service is held indefinitely at levels below those prevailing today. Even if substantial local exchange competition does not emerge, this proposal leaves the Companies with little room to exploit any market power which they might then possess.

B. Service quality

Q. PLEASE DESCRIBE HOW THE STIPULATED PLAN WILL REASONABLY ASSURE THE CONTINUATION OF BASIC LOCAL EXCHANGE SERVICE THAT MEETS REASONABLE SERVICE STANDARDS THAT THE COMMISSION MAY ADOPT.

A. There are several reasons why the Stipulated Plan will do so. First, as Mr. Sokol explained in his direct testimony, the Commission retains its powers to set and enforce service standards. Such standards should ensure that the Companies will meet reasonable quality standards. The Stipulated Plan explicitly acknowledges that "The Commission retains oversight for service quality, . . ."[14]

Second, competitive pressures naturally induce firms to meet reasonable service standards. As competitive alternatives become more and more available in North Carolina, customers will have an opportunity to buy another carrier's services if that carrier offers a superior combination of service standards, quality, features, and price than the Companies offer. In the old monopoly franchise environment, customers had few choices, and now they will. Thus, the Companies' incentive to maintain reasonable service standards will be higher than ever.

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[14] Stipulation and Agreement between the Public Staff of the North Carolina Utilities Commission, and Carolina Telephone and Telegraph Company and Central Telephone Company, Docket No. P-7, Sub 825, and P-10, Sub 479 (January 31, 1996), Attachment A, Exhibit 1, p. 16.

Third, the Companies have built a reputation for quality service. This association in customers' minds between the Companies and quality service is an asset in the marketplace. Such a reputation is fragile and easily damaged by any deterioration in service standards. It is in the Companies' interest to preserve that reputation even if the Stipulated Plan had no other stimuli to do so.

Fourth, without the Stipulated Plan, the Companies would suffer more competitive losses and thus would lose more contribution. The reduction in cash flow without the Plan might jeopardize its ability to continue its historically high level of service quality. Thus, the Plan enhances the likelihood of maintaining reasonable service standards.

C. Prevention of anticompetitive behavior

Q. IN WHAT WAYS DOES THE STIPULATED PLAN REDUCE THE LIKELIHOOD THAT THE COMPANIES WOULD UNREASONABLY PREJUDICE ANY CLASS OF TELEPHONE CUSTOMERS?

A. I assume that the phrase "unreasonable prejudice" should encompass the same behavior that would constitute unreasonable discrimination or predatory pricing. There are at least four reasons why the Stipulated Plan reduces the likelihood of such behavior.

First, the Companies must continue to use long run incremental costs (LRIC) as a floor for setting rates. This practice prevents predatory pricing. There are two understandable exceptions to the LRIC constraint: One is that, by Commission order, residential basic exchange service is priced in accordance with social pricing guidelines. The second is that the Companies may price below LRIC in good faith to meet a competitor's rate. This exception enables the Companies profitably to price below LRIC when their short run incremental costs are temporarily lower than their long run incremental costs. Such conditions occur, for instance, when facilities are available that would remain underutilized for some time.[15]

Second, as Mr. Potter's rebuttal testimony explains, the Stipulated Plan retains tariff requirements for all services to assure consistent price, terms and conditions for similarly situated

[15] There are also circumstances in which it can be procompetitive to meet a competitor's rate that is below the Company's own short run incremental costs.

customers. (The exception is Contract Service Arrangements, copies of which the Companies are to file with the Commission for information purposes.)

Third, most economists agree that predatory pricing or price squeeze strategies work only in situations where the predator or price squeezer has deep financial pockets, but his competitors do not. This is because these strategies only work to increase profits if, after a period in which prices are set below cost, potential competitors leave the market and the predator or price squeezer can recoup his profits by raising prices above costs. In this situation, however, the important potential market entrants are large carriers with substantial profits from other markets in which they operate or are dominant; hence they have substantial staying power. It is simply not reasonable for the Companies to anticipate that they can keep these entrants out of the North Carolina market by maintaining prices below cost for a short period of time. And if, to keep out entrants, the Companies must keep prices below cost indefinitely, the strategy is simply not profitable.

Fourth, relative to the situation with traditional rate of return regulation, the Stipulated Plan reduces the ability and incentive to cross-subsidize competitive services by raising rates for less competitive services. A long-standing argument against rate of return regulation has been that a rate-of-return regulated firm could attempt to lower prices below costs in a competitive market and recoup its losses there by raising prices in a less competitive market. It could cross-subsidize its competitive services in that way while maintaining its overall rate of return. In that hypothetical case, the firm's predation in the competitive market does not cost the firm very much, so, the argument goes, it might be tempted to try such anticompetitive behavior. In contrast, under price regulation, the firm is unable to raise any price in one service category while reducing prices below costs for a service in another category. Thus, the Stipulated Plan reduces the likelihood of anticompetitive pricing.

Q. WHAT ADDITIONAL RESTRICTIONS WILL PREVENT THE COMPANIES FROM UNREASONABLY PREJUDICING ANY CLASS OF TELEPHONE CUSTOMERS?

A. There are at least three regulatory and legal reasons why the Stipulated Plan will not unreasonably prejudice any class of telephone customers. First, the Companies must continue to abide by the Commission's decision regarding imputation of access rates for intraLATA toll. Second, any party alleging anticompetitive conduct still will have the right to complain to the Commission, which now has explicit authority to review alleged anticompetitive behavior. Finally, the Antitrust Division of the U.S. Department of Justice, the Federal Trade Commission, and competitors can sue to enjoin alleged anticompetitive practices, and competitors can sue to recover damages.

V. ADDITIONAL OBSERVATIONS

Q. OVER THE PAST DECADE, UNDER RATE OF RETURN REGULATION, NORTH CAROLINA'S BASIC LOCAL EXCHANGE CUSTOMERS HAVE SEEN NO RATE INCREASES. SOME RATES EVEN DECLINED. WHY SHOULD THE COMMISSION ADOPT A PLAN THAT ALLOWS BASIC LOCAL EXCHANGE SERVICE RATES TO RISE, AS MEASURED IN CURRENT YEAR DOLLARS?

A. Over the last decade customers in North Carolina have gotten a good deal. Rates have not gone up, even in nominal terms. The Companies have even reduced some rates, including that for Touch-Tone service. Thus, in real terms rates in North Carolina have fallen significantly.

If the GDP-PI rises, then the Stipulated Plan does permit the Companies to raise the rates for some service categories, as measured in current year dollars, if it chooses. However, as I showed before, the Plan will deliver cumulative rate decreases in real terms that will exceed local exchange carriers' historical differential productivity growth. Further, the compounded annual average rate decreases for the first five years of the Plan will exceed forecasted inflation during the period for the Basic Services category as a whole; in other words, the Plan will probably cause average rates to continue to decline in real terms. Thus, I believe the Plan will give North Carolina customers a good deal.

It is true that the real rate reductions for the Companies' basic local exchange service in North Carolina over the last ten years have been larger than would be explained by the industry's productivity gains alone. One might naively be tempted to think that the Companies ought to be able to repeat that performance if they were to remain under traditional rate of return regulation and that therefore the Stipulated Plan is not a good deal for customers. Such a syllogism would be truly naive and fallacious.

The Stipulated Plan will deliver overall rate decreases in real terms, but it is unrealistic to expect the Companies to avoid all Basic Service category or basic local exchange service rate increases in every year measured in current year dollars, with or without the Plan. The principal difficulty is that growing competition will reduce the subsidies from other services that have historically enabled the Companies to keep basic local exchange service rates low. The increasing competition for intraLATA toll is only the most obvious example. Competitors will make rapid inroads into the intraLATA toll market, particularly if the Stipulated Plan is not quickly implemented.

Q. WHY DOES THE STIPULATED PLAN CALL FOR AUTOMATIC PASS THROUGH OF THE FINANCIAL EFFECTS OF GOVERNMENT ACTIONS?

A. In a competitive industry, changes in these costs would alter the long run average cost curve of the industry and would directly affect the average price charged in the industry. Provided that the costs are not under the control of the firm, automatically flowing such cost changes through to customers would not affect the incentive of the firm to behave efficiently. Thus changes in these costs (1) should be flowed directly through to customers because that is what would occur in a competitive industry and (2) can be flowed through to customers without affecting the incentive of the firm to reduce its costs.

What is passed through is not the change in such costs for the telecommunications industry but rather the difference between the effect of the exogenous event on the telecommunications industry and the effect on the aggregate U.S. economy. A government action which affected all industry costs in the same proportion would be fully reflected in changes in the GDP-PI price index, and an additional exogenous cost adjustment would constitute double counting. However, regulatory exogenous cost changes apply only to telecommunications firms, and many other exogenous cost changes have a larger proportional effect on telecommunications firms than on an average U.S. firm.

Examples of exogenous cost changes include (1) changes in regulatory definitions and allocations of costs to services or jurisdictions, (2) changes in economic costs or cost allocations as defined by quasi-governmental accounting standards boards, (3) changes in costs due to